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EXAMINER	
THOMPSON, JAMES A	

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2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/772,664	OHASHI, KAZUHITO	
	Examiner	Art Unit	
	James A. Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 December 2004 and 21 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-72 and 74-89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/20/04, 4/21/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see page 25, lines 11-18, filed 09 December 2004, with respect to the information disclosure statement have been fully considered and are persuasive. The objection to the information disclosure statement listed in item 2 of the previous office action, dated 27 August 2004, has been withdrawn.

2. Applicant's arguments, see page 25, lines 20-23, filed 09 December 2004, with respect to the drawings have been fully considered and are persuasive. The objections to the drawings listed in item 3 of said previous office action have been withdrawn.

3. Applicant's arguments, see pages 26-28, filed 09 December 2004 have been fully considered but they are not persuasive.

Examiner has cited considerably more than figures 8 and 9 of Orito (US Patent 6,072,912) to demonstrate that Orito does indeed teach separately outputting image signals of a plurality of divided areas of said plurality of photoreceptive pixels from a plurality of output terminals corresponding to the plurality of divided areas. Figures 8 and 9 of Orito demonstrate that the image signal are a plurality of divided areas (column 6, lines 29-35 of Orito) of said plurality of photoreceptive pixels (column 5, lines 50-52 and lines 61-65 of Orito). The image data for the plurality of divided areas is produced by a set of CCDs during various scanning operations (column 8, lines 48-53 of Orito). As explained on page 5 of said previous office

action, some form of output terminals are inherently required to access the stored memory. Said output terminals correspond to their associated divided area of the image, since memory corresponding to a particular block of image data is accessed separately (column 8, lines 48-53 of Orito).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 7, 9-11, 13-14, 17-19, 23, 25-27, 29-30, 33-41, 44-46, 48, 52-55, 57-58, 60, 62-66, 69-71, 77-80, 82-83 and 85-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912).

Regarding claims 1, 17 and 33: Arimoto discloses an image sensing apparatus (figure 2 of Arimoto). Figure 1 and figure 3 of Arimoto show further details of said apparatus (column 3, lines 3-5 and lines 8-10 of Arimoto).

Said apparatus comprises an image sensor (figure 1(210) of Arimoto) which outputs image signals (column 4, lines 56-58 of Arimoto) of a plurality of photoreceptive pixels (CCD) from an output terminal (column 4, lines 53-56 of Arimoto).

Said apparatus further comprises an adjustment unit (figure 1(106(portion)) of Arimoto) adapted to adjust levels of the

image signal output from the output terminal (column 9, lines 35-40 of Arimoto) so as to substantially correspond with a predetermined reference level (column 9, lines 52-56 and column 10, lines 1-4 of Arimoto) when said image sensor reads a reference density member having a predetermined density (column 7, lines 31-36 of Arimoto). The adjustment unit corresponds to the portion of the CPU, along with the corresponding embodied computer routines, that performs the functions of said adjustment unit.

Arimoto does not disclose expressly that said image sensor separately outputs image signals of a plurality of divided areas, each area having a plurality of photoreceptive pixels from a plurality of output terminals corresponding to the plurality of divided areas.

Orito discloses separately outputting image signals of a plurality of divided areas (figure 8; figure 9; and column 6, lines 29-35 of Orito), each area having a plurality of photoreceptive pixels (column 5, lines 50-52 and lines 61-65 of Orito) from a plurality of output terminals corresponding to the plurality of divided areas (column 8, lines 48-53 of Orito). Image signals are placed in memory based on the particular block to which said signals correspond (column 8, lines 48-53 of Orito). In order to access said signals placed in memory, some form of output terminal is required. Since memory corresponding to a particular block of image data is accessed (column 8, lines 48-53 of Orito), said output terminals would therefore correspond to their associated divided area of the image.

Arimoto and Orito are combinable because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been

obvious to a person of ordinary skill in the art to process and adjust the image data based on said reference member, as taught by Arimoto, for each of a plurality of divided areas of an image, as taught by Orito. The motivation for doing so would have been that each of a plurality of CCDs (column 1, lines 54-57 of Orito) has different electronic characteristics (column 1, lines 62-63 of Orito) and even a single CCD can produce different tone data values when the irradiation light intensity varies (column 1, lines 63-65 of Orito). Therefore, it is beneficial to obtain correction data from a plurality of divided areas (column 2, lines 21-23 of Orito). Therefore, it would have been obvious to combine Orito with Arimoto to obtain the invention as specified in claims 1, 17 and 33.

Further regarding claim 17: The apparatus of claim 1 performs the method of claim 17.

Further regarding claim 33: Arimoto discloses that the operations of said apparatus are performed using computer-readable program code (column 5, lines 20-23 of Arimoto).

Regarding claims 2 and 18: Arimoto discloses that said adjustment unit adjusts the levels of the image signals output from said output terminals using look up tables (figure 1(112') and column 60-67 of Arimoto).

Regarding claims 3 and 19: Arimoto discloses that said adjustment unit adjusts the levels of the image signals output from said output terminals (column 10, lines 1-4 of Arimoto) using operation equations (column 9; equation 1, lines 24-25, lines 31-33, and lines 38-40 of Arimoto).

Regarding claims 7 and 23: Arimoto discloses a shading correction unit (figure 1(112') and column 5, lines 29-33 of Arimoto) wherein said adjustment unit (figure 1(106(portion)) of

Arimoto) is arranged upstream to said shading correction unit, as can clearly be seen in figure 1 of Arimoto since the shading correction unit (figure 1(112') of Arimoto) is placed just before the video output.

Further regarding claims 9 and 25: Orito discloses separately outputting signals of a right-side divided area (WA1684) from signals of a left-side divided area (WA1) (figure 8 and column 8, lines 56-61 of Orito). WA1 is a divided area on the left side and WA1684 is a divided area on the right side, as shown in figure 8 of Orito. Since the average white level values are used in correction calculations (column 9, lines 39-45 of Orito), it is inherent that said white level values are output.

Regarding claims 10 and 26: Arimoto discloses that said image sensor is a linear image sensor (column 4, lines 53-56 of Arimoto).

Regarding claims 11 and 27: Arimoto discloses that a plurality of said linear image sensors respectively corresponding to a plurality of colors are provided to form a color image sensor (column 19, line 65 to column 20, line 1 of Arimoto).

Regarding claims 13 and 29: Arimoto discloses that said reference density member (figure 3(301P) of Arimoto) is provided within the image sensing apparatus (column 6, lines 22-26 of Arimoto).

Regarding claims 14 and 30: Arimoto discloses a platen (figure 3(15) of Arimoto) for placing an original to be read (column 5, lines 40-43 of Arimoto), wherein said image sensor reads said reference density member (column 6, lines 41-43 of

Arimoto) in a case where said reference density member is placed on said platen (column 6, lines 26-30 of Arimoto).

Regarding claims 34, 35 and 36: Arimoto discloses an image sensing apparatus (figure 2 of Arimoto). Figure 1 and figure 3 of Arimoto show further details of said apparatus (column 3, lines 3-5 and lines 8-10 of Arimoto).

Said apparatus comprises an image sensor (figure 1(210) of Arimoto) which outputs image signals (column 4, lines 56-58 of Arimoto) of a plurality of photoreceptive pixels (CCD) from an output terminal (column 4, lines 53-56 of Arimoto).

Said apparatus further comprises an adjustment unit (figure 1(106(portion)) of Arimoto) adapted to adjust levels of the image signal output from the output terminal (column 9, lines 35-40 of Arimoto) so as to substantially correspond with a predetermined reference level (column 9, lines 52-56 and column 10, lines 1-4 of Arimoto). The adjustment unit corresponds to the portion of the CPU, along with the corresponding embodied computer routines, that performs the functions of said adjustment unit.

Said apparatus further comprises a shading correction unit (figure 1(112') of Arimoto) adapted to apply shading correction to the image signals whose levels were adjusted by the said adjustment unit (column 5, lines 29-33 of Arimoto).

Arimoto does not disclose expressly that said image sensor separately outputs image signals of a plurality of divided areas of said plurality of photoreceptive pixels from a plurality of output terminals corresponds to the plurality of divided areas.

Orito discloses separately outputting image signals of a plurality of divided areas (figure 8; figure 9; and column 6, lines 29-35 of Orito) of said plurality of photoreceptive pixels

(column 5, lines 50-52 and lines 61-65 of Orito) from a plurality of output terminals corresponding to the plurality of divided areas (column 8, lines 48-53 of Orito). Image signals are placed in memory based on the particular block to which said signals correspond (column 8, lines 48-53 of Orito). In order to access said signals placed in memory, some form of output terminal is required. Since memory corresponding to a particular block of image data is accessed (column 8, lines 48-53 of Orito), said output terminals would therefore correspond to their associated divided area of the image.

Arimoto and Orito are combinable because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to process and adjust the image data based on said reference member, as taught by Arimoto, for each of a plurality of divided areas of an image, as taught by Orito. The motivation for doing so would have been that each of a plurality of CCDs (column 1, lines 54-57 of Orito) has different electronic characteristics (column 1, lines 62-63 of Orito) and even a single CCD can produce different tone data values when the irradiation light intensity varies (column 1, lines 63-65 of Orito). Therefore, it is beneficial to obtain correction data from a plurality of divided areas (column 2, lines 21-23 of Orito). Therefore, it would have been obvious to combine Orito with Arimoto to obtain the invention as specified in claims 34, 35 and 36.

Further regarding claim 35: The apparatus of claim 34 performs the method of claim 35.

Further regarding claim 36: Arimoto discloses that the operations of said apparatus are performed using computer-readable program code (column 5, lines 20-23 of Arimoto).

Regarding claims 37, 62 and 86: Arimoto discloses an image sensing apparatus (figure 2 of Arimoto). Figure 1 and figure 3 of Arimoto show further details of said apparatus (column 3, lines 3-5 and lines 8-10 of Arimoto).

Said apparatus comprises an image sensor (figure 1(210) of Arimoto) which outputs image signals (column 4, lines 56-58 of Arimoto) of a plurality of photoreceptive pixels (CCD) from an output terminal (column 4, lines 53-56 of Arimoto).

Said apparatus further comprises a reference level acquisition unit (figure 1(106(portion)) of Arimoto) adapted to acquire a first reference level based on the image signals output from said output terminal when said image sensor reads a white member (column 6, lines 44-49 of Arimoto), and acquire a second reference level based on the image signal output from said output terminal when said image sensor reads a reference density member having a predetermined density of halftone (column 6, lines 26-34 of Arimoto). The reference level acquisition unit corresponds to the portion of the CPU, along with the corresponding embodied computer routines, that performs the functions of said reference level acquisition unit.

Said apparatus further comprises an adjustment unit (figure 1(106(portion)) of Arimoto) adapted to adjust level of the image signal output from said output terminal so that level of the image signal output from said output terminal substantially corresponds with said first reference level when said image sensor reads said white member (column 7, lines 48-55 of Arimoto), and adjust level of the image signal output from each

area of said image sensor so that level of the image signal output from said output terminal substantially corresponds with said second reference level when said image sensor reads said reference density member (column 9, lines 52-56 and column 10, lines 1-4 of Arimoto). The adjustment unit corresponds to the portion of the CPU, along with the corresponding embodied computer routines, that performs the functions of said adjustment unit.

Arimoto does not disclose expressly that said image sensor separately outputs image signals of a plurality of divided areas, each area having a plurality of photoreceptive pixels, from a plurality of output terminals corresponds to the plurality of divided areas.

Orito discloses separately outputting image signals of a plurality of divided areas (figure 8; figure 9; and column 6, lines 29-35 of Orito) of said plurality of photoreceptive pixels (column 5, lines 50-52 and lines 61-65 of Orito) from a plurality of output terminals corresponding to the plurality of divided areas (column 8, lines 48-53 of Orito). Image signals are placed in memory based on the particular block to which said signals correspond (column 8, lines 48-53 of Orito). In order to access said signals placed in memory, some form of output terminal is required. Since memory corresponding to a particular block of image data is accessed (column 8, lines 48-53 of Orito), said output terminals would therefore correspond to their associated divided area of the image.

Arimoto and Orito are combinable because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to process and

adjust the image data based on said reference member, as taught by Arimoto, for each of a plurality of divided areas of an image using parallel image data processing, as taught by Orito. There would therefore be a plurality of output terminals accessed by said reference level acquisition unit and said adjustment unit. The motivation for doing so would have been that each of a plurality of CCDs (column 1, lines 54-57 of Orito) has different electronic characteristics (column 1, lines 62-63 of Orito) and even a single CCD can produce different tone data values when the irradiation light intensity varies (column 1, lines 63-65 of Orito). Therefore, it is beneficial to obtain correction data from a plurality of divided areas (column 2, lines 21-23 of Orito). Therefore, it would have been obvious to combine Orito with Arimoto to obtain the invention as specified in claims 37, 62 and 86.

Further regarding claim 62: The apparatus of claim 37 performs the method of claim 62.

Further regarding claim 86: Arimoto discloses that the operations of said apparatus are performed using computer-readable program code (column 5, lines 20-23 of Arimoto).

Regarding claims 38 and 63: Arimoto discloses that said reference density member (figure 3(301P) of Arimoto) is provided within the image sensing apparatus (column 6, lines 22-26 of Arimoto).

Regarding claims 39 and 64: Arimoto discloses a platen (figure 3(15) of Arimoto) for placing an original to be read (column 5, lines 40-43 of Arimoto), wherein said image sensor reads said reference density member (column 6, lines 41-43 of Arimoto) in a case where said reference density member is placed on said platen (column 6, lines 26-30 of Arimoto).

Regarding claims 40 and 65: Arimoto discloses that at least one of the first and second reference levels is set in advance (column 6, lines 26-31 of Arimoto). The reference patch (figure 3(301P) of Arimoto) is set to a predetermined level (0.1) (column 6, lines 26-31 of Arimoto) and used as a reference level for the shading correction (column 6, lines 42-43 of Arimoto).

Regarding claims 41 and 66: Arimoto does not disclose expressly that said first reference level is an average of signal levels when said white member is scanned.

Orito discloses a predetermined level (W1) (column 7, lines 45-50 of Orito) which is an average of signal levels when a white member is scanned (column 8, lines 50-57 of Orito).

Arimoto and Orito are combinable because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to scan said white member to obtain an average of signal levels to store as said reference level, as taught by Orito, said reference level being said first reference level taught by Arimoto. The motivation for doing so would have been to obtain the data needed to perform white level correction (column 4, lines 3-8 of Orito). Therefore, it would have been obvious to combine Orito with Arimoto to obtain the invention as specified in claims 41 and 66.

Regarding claims 44 and 69: Arimoto discloses that the signal level value for the reference member (figure 3(301P) of Arimoto) is uniform and unchanging over the area of said reference member (column 6, lines 38-43 of Arimoto). Therefore, said second reference level is an average of signal levels when

said reference density board is scanned, since said average is equal to said uniform signal level value.

Regarding claims 45 and 70: Arimoto discloses that the signal level value for the reference member (figure 3(301P) of Arimoto) is uniform and unchanging over the area of said reference member (column 6, lines 38-43 of Arimoto). Therefore, said second reference level is a maximum of signal levels when said reference density board is scanned, since said maximum is equal to said uniform signal level value.

Regarding claims 46 and 71: Arimoto discloses that the signal level value for the reference member (figure 3(301P) of Arimoto) is uniform and unchanging over the area of said reference member (column 6, lines 38-43 of Arimoto). Therefore, said second reference level is a minimum of signal levels when said reference density board is scanned, since said minimum is equal to said uniform signal level value.

Regarding claim 48: Arimoto discloses that said adjustment unit acquires adjusts maximum levels of image signals so that they become maximum levels after adjustment (column 10, lines 5-10 of Arimoto). After said adjustment by said adjustment unit (column 9, lines 52-56 and column 10, lines 1-4 of Arimoto), the output pixel values that are set to 255 (the maximum value for eight bits) based on the normalization with respect to the standard white plate density measurement (column 10, lines 5-10 of Arimoto).

Regarding claims 52 and 77: Arimoto discloses that said adjustment data is in a form of a look up table (figure 1(112') and column 60-67 of Arimoto).

Further regarding claims 53 and 78: Orito discloses separately outputting signals of a right-side divided area

(WA1684) from signals of a left-side divided area (WA1) (figure 8 and column 8, lines 56-61 of Orito). WA1 is a divided area on the left side and WA1684 is a divided area on the right side, as shown in figure 8 of Orito. Since the average white level values are used in correction calculations (column 9, lines 39-45 of Orito), it is inherent that said white level values are output.

Regarding claims 54 and 79: Arimoto discloses that said image sensor is a linear image sensor (column 4, lines 53-56 of Arimoto).

Regarding claims 55 and 80: Arimoto discloses that a plurality of said linear image sensors respectively corresponding to a plurality of colors are provided to form a color image sensor (column 19, line 65 to column 20, line 1 of Arimoto).

Regarding claims 57 and 82: Arimoto discloses that each of said plurality of signal processing units includes an amplifier (figure 1(101) of Arimoto) for amplifying the image signal output from the output terminal (column 5, lines 1-2 of Arimoto).

Regarding claims 58 and 83: Arimoto discloses an A/D converter (figure 1(102) of Arimoto) adapted to convert the image signal output from the output terminal from an analog signal to a digital signal (column 5, lines 2-3 of Arimoto).

Since Arimoto in view of Orito teaches a plurality of output terminals, as discussed in the arguments regarding claims 37, 62 and 86, Arimoto in view of Orito therefore teaches a plurality of A/D converters, each adapted to convert the image signal output from each output terminal from an analog to a digital signal. Since there are multiple output terminals,

multiple A/D converters are required, one for each output terminal.

Regarding claims 60 and 85: Arimoto discloses that said reference density member has at least a portion of uniform density (column 6, lines 37-43 of Arimoto).

6. Claims 4-5 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912) and Yamamoto (US Patent 5,526,048).

Regarding claims 4 and 20: Arimoto discloses that said adjustment unit adjusts the levels of the image signals output from said output terminals so as to substantially correspond with the level of the predetermined reference signal (column 8, lines 1-5 of Arimoto) on the basis of data obtained by reading said reference density member by said image sensor (column 10, lines 1-4 of Arimoto).

Arimoto in view of Orito does not disclose expressly that said adjusting occurs while changing the accumulation period.

Yamamoto discloses adjusting image data by changing the accumulation period (column 4, line 62 to column 5, line 2 of Yamamoto).

Arimoto in view of Orito is combinable with Yamamoto because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to change the accumulation period in order to affect the overall gain and white balance, as taught by Yamamoto. The motivation for doing so would have been to be able to adjust the image data directly with the CCD instead of requiring a separate analog signal adjustment circuit (column 6, lines 9-13 of Yamamoto).

Therefore, it would have been obvious to combine Yamamoto with Arimoto in view of Orito to obtain the invention as specified in claims 4 and 20.

Regarding claims 5 and 21: Arimoto does not disclose expressly that said adjustment unit adjusts the levels of the image signals output from said output terminals on the basis of levels obtained by subtracting dark current level output during the accumulation period which is used for reading said reference density member from the levels of the image signals output from said output terminals.

Orito discloses subtracting the dark current level output during the accumulation period which is used for reading said reference density member (column 5, lines 55-58 of Orito) from the levels of the image signals out from said output terminals (column 5, lines 58-62 of Orito).

Arimoto and Orito are combinable because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to subtract the dark current level from the image signal levels, as taught by Orito. The motivation for doing so would have been to obtain the base black level upon which to produce the tonal gradations between black and white (column 5, lines 60-62 of Orito). Therefore, it would have been obvious to combine Orito with Arimoto to obtain the invention as specified in claims 5 and 21.

7. Claims 6, 12, 22, 28, 42-43, 47, 56, 67-68, 72 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912) and Irie (US Patent 5,644,409).

Regarding claims 6 and 22: Arimoto discloses a shading correction unit (figure 1(112') and column 5, lines 29-33 of Arimoto).

Arimoto in view of Orito does not disclose expressly that said adjustment unit is arranged downstream to said shading correction unit.

Irie discloses a shading correction unit (figure 1(4) and column 5, lines 46-48 of Irie) that operates before the other image processing units, as can clearly be seen in figure 1 of Irie, which adjust the shading corrected image signal based on other criteria (column 5, lines 54-55 and column 6, lines 1-6 of Irie).

Arimoto in view of Orito is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to place the shading correction unit before the other image processing units, as taught by Irie, one of said other image processing units being the adjustment unit taught by Arimoto. The motivation for doing so would have been to eliminate initial non-uniformities before further processing is performed (column 5, lines 47-53 of Irie). Therefore, it would have been obvious to combine Irie with Arimoto in view of Orito to obtain the invention as specified in claims 6 and 22.

Regarding claims 12 and 28: Arimoto in view of Orito does not disclose expressly that said image sensor is an area image sensor.

Irie discloses an area image sensor (figure 1(1) and column 5, lines 29-32 of Irie).

Arimoto in view of Orito is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use an area image sensor, as taught by Irie, for the image sensor taught by Arimoto. The motivation for doing so would have been to be able to read data two-dimensionally (column 5, lines 31-32 of Irie). Therefore, it would have been obvious to combine Irie with Arimoto in view of Orito to obtain the invention as specified in claims 12 and 28.

Regarding claims 42 and 67: Arimoto in view of Orito does not disclose expressly that said first reference level is a maximum of signal levels when said white member is scanned.

Irie discloses using the maximum (WMAX2) of the obtained signal levels (column 7, lines 26-30 of Irie) for performing white level correction (column 8, lines 22-25 of Irie).

Arimoto in view of Orito is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the maximum of the obtained signal levels, as taught by Irie, instead of the average, as taught by Orito. The motivation for doing so would have been to be able to perform white level correction for a case when the white member is not dirty as a whole, but partially dirty (column 8, lines 23-25 of Irie). Therefore, it would have been obvious to combine Irie with Arimoto in view of Orito to obtain the invention as specified in claims 42 and 67.

Regarding claims 43 and 68: Arimoto in view of Orito does not disclose expressly that said first reference level is a minimum of signal levels when said white member is scanned.

Irie discloses using the minimum (WMAX1) of the obtained signal levels (column 7, lines 21-25 of Irie) for performing white level correction (column 8, lines 15-21 of Irie).

Arimoto in view of Orito is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the minimum of the obtained signal levels, as taught by Irie, instead of the average, as taught by Orito. The motivation for doing so would have been to be able to perform white level correction for a case when the white member is not dirty (column 8, lines 16-17 of Irie). Therefore, it would have been obvious to combine Irie with Arimoto in view of Orito to obtain the invention as specified in claims 43 and 68.

Regarding claims 47 and 72: The limitations disclosed in claims 47 and 72 comprise the limitations disclosed in claims 42 and 67 and the limitations disclosed in claims 46 and 71. Therefore, the arguments regarding claims 42 and 67 and the arguments regarding claims 46 and 71 are incorporated herein.

Regarding claims 56 and 81: Arimoto in view of Orito does not disclose expressly that said image sensor is an area image sensor.

Irie discloses an area image sensor (figure 1(1) and column 5, lines 29-32 of Irie).

Arimoto in view of Orito is combinable with Irie because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have

been obvious to a person of ordinary skill in the art to use an area image sensor, as taught by Irie, for the image sensor taught by Arimoto. The motivation for doing so would have been to be able to read data two-dimensionally (column 5, lines 31-32 of Irie). Therefore, it would have been obvious to combine Irie with Arimoto in view of Orito to obtain the invention as specified in claims 56 and 81.

8. Claims 8 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912), Irie (US Patent 5,644,409) and Yamada (US Patent 5,457,547).

Regarding claims 8 and 24: Arimoto discloses a shading correction unit (figure 1(112') and column 5, lines 29-33 of Arimoto) wherein said adjustment unit (figure 1(106(portion)) of Arimoto) is arranged upstream to said shading correction unit, as can clearly be seen in figure 1 of Arimoto since the shading correction unit (figure 1(112') of Arimoto) is placed just before the video output.

Arimoto in view of Orito does not disclose expressly a switch for changing a processing order of said adjustment unit and said shading correction unit.

Irie discloses a shading correction unit (figure 1(4) and column 5, lines 46-48 of Irie) that operates before the other image processing units, as can clearly be seen in figure 1 of Irie, which adjust the shading corrected image signal based on other criteria (column 5, lines 54-55 and column 6, lines 1-6 of Irie).

Arimoto in view of Orito is combinable with Irie because they are from the same field of endeavor, namely digital image

data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have an additional arrangement wherein the shading correction unit is placed before the other image processing units, as taught by Irie, one of said other image processing units being the adjustment unit taught by Arimoto. The motivation for doing so would have been to eliminate initial non-uniformities before further processing is performed (column 5, lines 47-53 of Irie). Therefore, it would have been obvious to combine Irie with Arimoto in view of Orito.

Arimoto in view of Orito and Irie does not disclose expressly a switch for changing a processing order of said adjustment unit and said shading correction unit.

Yamada discloses a switch (figure 2(605) of Yamada) which selects which data is used for the shading correction (column 4, lines 1-6 of Yamada), and thus the overall image processing and correction.

Arimoto in view of Orito and Irie is combinable with Yamada because they are from the same field of endeavor, namely digital image data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a switch to determine which data is used for the image processing, as taught by Yamada. Said data to be selected is either the output of the arrangement wherein said adjustment unit is arranged upstream to said shading correction unit, as taught by Arimoto, or the output of the arrangement wherein said adjustment unit is arranged downstream to said shading correction unit, as taught by Arimoto in view of Orito and Irie. The motivation for doing so would have been to be able to provide the optimum shading correction depending on the received

image data (column 2, lines 3-6 of Yamada). Therefore, it would have been obvious to combine Yamada with Arimoto in view of Orito and Irie to obtain the invention as specified in claims 8 and 24.

9. Claims 15-16 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912) and Usami (US Patent 5,960,110).

Regarding claims 15 and 31: Arimoto in view of Orito does not disclose expressly that the image sensing apparatus is connected to a printer and said reference density member is printed on said printer.

Usami discloses that the image sensing apparatus is connected to a printer (figure 5(20) and column 7, lines 28-30 of Usami) and a reference output condition, e.g. reference printing density, is printed (column 7, lines 40-43 of Usami).

Arimoto in view of Orito is combinable with Usami because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to connect said image sensing apparatus to a printer and print out a reference density, as taught by Usami, said reference density being the density of said reference density member taught by Arimoto. The motivation for doing so would have been to generate predictions for the corrected output conditions (column 7, lines 47-50 of Usami). Therefore, it would have been obvious to combine Usami with Arimoto in view of Orito to obtain the invention as specified in claims 15 and 31.

Further regarding claims 16 and 32: Usami discloses that an image sensing apparatus (figure 5 and column 7, lines 20-23

of Usami) is integrally configured with said printer (figure 5(20) of Usami), since said printer is used to generate the reference images based on the apparatus output conditions (column 7, lines 28-33 of Usami).

10. Claims 49-51 and 74-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912) and Sawada (US Patent 5,912,992).

Regarding claims 49 and 74: Arimoto in view of Orito does not disclose expressly that the levels between said first and second reference levels are interpolated by a straight line.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada), said interpolation being linear interpolation (column 4, lines 30-31 of Sawada).

Arimoto in view of Orito is combinable with Sawada because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use linear interpolation to interpolate image data values when said image data is between predetermined points, as taught by Sawada, said image data values being the image signal levels output from said plurality of signal processing units and said linear interpolation being performed by said adjustment data acquisition unit to match said levels that are between said first and second predetermined levels. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with Arimoto in view

of Orito to obtain the invention as specified in claims 49 and 74.

Regarding claims 50 and 75: Arimoto in view of Orito does not disclose expressly that the levels between said first and second predetermined levels are interpolated by a curve.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada), said interpolation being performed using a curve (column 4, lines 31-34 of Sawada).

Arimoto in view of Orito is combinable with Sawada because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use curve interpolation to interpolate image data values when said image data is between predetermined points, as taught by Sawada, said image data values being the image signal levels output from said plurality of signal processing units and said curve interpolation being performed by said adjustment data acquisition unit to match said levels that are between said first and second predetermined levels. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with Arimoto in view of Orito to obtain the invention as specified in claims 50 and 75.

Regarding claims 51 and 76: Arimoto in view of Orito does not disclose expressly that interpolation is performed by operation.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4,

lines 25-28 of Sawada), said interpolation being performed by operations, such as linear interpolation operations and curve interpolation operations (column 4, lines 30-34 of Sawada).

Arimoto in view of Orito is combinable with Sawada because they are from the same field of endeavor, namely image data processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the interpolation using operations, as taught by Sawada. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with Arimoto in view of Orito to obtain the invention as specified in claims 51 and 76.

11. Claims 59, 61 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912) and Usami (US Patent 5,960,110).

Regarding claims 59 and 84: Arimoto in view of Orito does not disclose expressly that the image sensing apparatus is connected to a printer and said reference density member is printed on said printer.

Usami discloses that the image sensing apparatus is connected to a printer (figure 5(20) and column 7, lines 28-30 of Usami) and a reference output condition, e.g. reference printing density, is printed (column 7, lines 40-43 of Usami).

Arimoto in view of Orito is combinable with Usami because they are from the same field of endeavor, namely scanned digital tone data correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to connect said image sensing apparatus to a printer and print out

a reference density, as taught by Usami, said reference density being the density of said reference density member taught by Arimoto. The motivation for doing so would have been to generate predictions for the corrected output conditions (column 7, lines 47-50 of Usami). Therefore, it would have been obvious to combine Usami with Arimoto in view of Orito to obtain the invention as specified in claims 59 and 84.

Further regarding claims 61: Usami discloses that an image sensing apparatus (figure 5 and column 7, lines 20-23 of Usami) is integrally configured with said printer (figure 5(20) of Usami), since said printer is used to generate the reference images based on the apparatus output conditions (column 7, lines 28-33 of Usami).

12. Claims 87-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arimoto (US Patent 5,371,613) in view of Orito (US Patent 6,072,912) and Sawada (US Patent 5,912,992).

Regarding claims 87-89: Arimoto in view of Orito does not disclose expressly that said adjustment unit adjusts so that the level of the image signal output from each of said output terminals substantially corresponds with a level obtained by interpolating between said first and second reference levels when said image sensor reads an image having a density other than the density of said white member and said reference density member.

Sawada discloses using interpolation to determine image data values that are not located at a sample point (column 4, lines 25-28 of Sawada).

Arimoto in view of Orito is combinable with Sawada because they are from the same field of endeavor, namely image data

processing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use interpolation to interpolate image data values when said image data is between predetermined points, as taught by Sawada, said predetermined points being said first and second predetermined levels taught by Arimoto in view of Orito. The motivation for doing so would have been to improve the accuracy of the image pixel reproduction for values between known points (column 2, lines 23-29 of Sawada). Therefore, it would have been obvious to combine Sawada with Arimoto in view of Orito to obtain the invention as specified in claims 87-89.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
08 June 2005

THOMAS D
~~TOMMY~~ LEE
PRIMARY EXAMINER